UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,236	09/15/2003	Eric J. Larsen	SONYP029	3753

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/663,236	LARSEN ET AL.
	Examiner	Art Unit	
	EMMANUEL OMOTOSHO	3714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 August 2009*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,6-12,14-19,46-50 and 59-61* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6-12,14-19,46-50 and 59-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date *8/10/09*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

Applicant should note that the large number of references in the attached IDS

have been considered by the examiner in the same manner as other documents in

Office search files are considered by the examiner while conducting a search of the

prior art in a proper field of search. **See MPEP 609.05(b).** Applicant is requested to

point out any particular references in the IDS which they believe may be of particular

relevance to the instant claimed invention <u>in response to this office action</u>

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
        obviousness or nonobviousness.

3.   Claims 1, 6-19, 21,46-50 and 59-61 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kang US Patent 6,009,210 and further in view of Kanade et al. US

Patent 6,151,009.

4.   Kang teaches a method for processing interactive user control for a view of a

scene displayed on a virtual window comprising:

5.   In regards to claims 1,14-15,46,47,59,61

        a.   Identifying a head of a user that is to interact with the scene (Col 1 lines

        43-47 and Col 3 lines 29-32)

        b.   Storing an initial frame of image data representing the head of the user

        (Col 3 lines 29-35)

        c.   Tracking the identified head of the user during display of the scene, the

        tracking enabling detection of a change in location of the head of the user

        (Abstract)

        d.   Tracking including identifying a search region within a frame of the user

        image data and comparing values within the search region to template values of

        the initial frame of the stored image data; adjusting a view frustum ('a view

        frustum' is being interpreted as the "view of the user into the virtual world") **in**

        accordance with the change in location of the head of the user (Col 2 lines

        34-43 and Col 3 lines 4-21)

        e.   Repeating the identifying the search region, the comparing, and adjusting

        for successive frames of the scene, wherein the comparing is performed with the

        initial frame of the stored image data (Col 2 lines 34-43 and Col 9 lines 17-44)

        f.   A computing device and a display screen in communication with the

        computing device configured to display image data defined through a view-

        frustum (Fig 1)

       g.   Tracking device is a camera (Fig 1)

       h.   a view frustum initially defined by a gaze projection set between outer

edges of a virtual window when the location of the head is substantially normal to

about a center point of the virtual window (Figs 1-3)

6.   In regards to claim 16 adjusting the view-frustum moves the location of the head

away from normal relative to the center point of the virtual window (Col 2 lines 34-43)

7.   In regards to claim 17,59,61, location of the head being away from normal

relative to the center point of the virtual window changes an angle of the gaze

projection, the change in angle of the gaze projection displays a change in viewing

angle of the scene provided by the video clip (Col 4 line 60- Col 5 line 49)

8.   In regards to claim 60, the change in viewing angle of the scene is a result of the

detected movement of the head of the user to enable the interaction with the scene (Col

4 line 60- Col 5 line 49)

9.   In regards to claim 1,6-7,14,46,49,50 Kang fail to specifically teach

       i.   Adjusting a scale of the scene according to a change in a distance of the

head of the user from a capture device

       j.   Using a capture device having depth-capturing capability.

10.   Kanade teaches the use of a depth capturing camera for interaction with a view

of a scene (abstract)

11.   One of ordinary skill in the art, at the time of the invention, would have been

motivated to have a system that interacts with a view of a scene using depth capturing

device to adjust a scale of the scene according to a change in a distance of the head of

the user from the capture device. Using a depth camera, the system would be able to

> k.   Obtain distance or depth information from the object being tracked
>
> (inherent of "depth camera)
>
> l.   Determine any interaction such as occluding, shadowing, reflecting or
>
> colliding (Kanade abstract)
>
> m.   Generate appropriate output based on said determination (Kanade
>
> abstract)

12.   **Wherein the adjusted view frustum defined by an updated gaze projection**

of the changed location of the head through the outer edges of the virtual window

((Col 2 lines 34-43 and Col 3 lines 4-21), examiner interprets this limitation as, 'as the

user moves his/her head, the view frustum is changed to reflect said change'). **In**

regards to laterally adjusting the view frustum in a direction opposite to the

change in location of the head of the user (see cols 3-4 of Kang), applicant should

respectfully note that the location of the user's head and the location of the view

frustum are opposite each other (i.e. the user is facing the view). Thus, they have

different orientation (i.e. the user's left is the view frustum's right). Furthermore,

the examiner interprets this limitation as ' as the user moves his/her head, the

view frustum is changed to reflect the appropriate view perspective '. For

example, if the user moves his/her head to the left, the vertex of rotational angle

(i.e. the viewpoint around the viewing axis) will need to shift to the right (in

respect of the user) to show the scene on the left of the user. Similar to if a

person wants to move his/her head to see what is on the left, the back of the

person's head has to move to the right while the persons view moves to the right

to see what is on the left.

13.   In regards to claim 8, the initial frame of image data is marker-less (Fig 1)

14.   In regards to claim 9, the initial frame of data is maintained throughout the video

clip (Fig 1)

15.   In regards to claim 10,48, the video clip is of a video game. Although Kang

teaches the method to be generally associated with virtual environment in computer

systems, Kang further teaches that video games are well known in the art as virtual

environment in a computer system (Col 1 lines 26-40)

16.   In regards to claim 11, the interaction with the scene by tracking movement of the

head of the user is independent of user hand-held controls for interacting with the video

game (Col 1 lines 5-9)

17.   In regards to claim 12, the method operation of tracking the identified head of the

user during display of the video clip includes tracking a facial portion of the head and

matching gray scale image data associated with the facial portion to image associated

with a template of the facial portion (Col 9 lines 20-33)

18.   In regards to claim 18-19,50, the method of adjusting a view frustum in

accordance with the change in location of the head of the user includes identifying a

point of interest of the scene of the video clip and modifying the view-frustum so that the

point of interest appears at a constant location when displayed in successive video clips

(Kang Claim 6). The Examiner should point out that each frame in Kang's disclosure

has to be scanned before the scene transformation could occur.

19.   In regards to claim 21,49-50, the method operation of translating a view frustum

in accordance with the change in location of the head of the user includes rotating the

view-frustum about the head of a user according to the change in location of the head of

the user (Kang Claim 5).

Response to Arguments

20.   Applicant's arguments filed 11/14/08 have been fully considered but they are not

persuasive.

21.   On pages 11-12, applicant argues, "The first method taught is "to directly use the

pose parameters to determine the absolute position and orientation of the viewpoint"

(Col. 8, lines 27-29). In other words, movement of a user's head in a given direction

produces movement of the view of the virtual reality environment in the same direction.

The second method taught applies the same directional system, but incorporates

incremental control to "indicate continuous movement within the virtual reality

environment" (Col. 8, lines 32-40). In contrast to Kang, Applicants' claim 1 is directed

towards a view of a scene comprising a view-frustum defined with reference to a gaze

projection of a position of the head of the user through the outer edges of a virtual

window. The volumetric virtual space beyond the virtual window which is delimited by

the gaze projection through the outer edges defines the view-frustum. And as the user's

head moves, the view-frustum is adjusted accordingly, such that the gaze projection

through the virtual window is updated in light of the changed position of the user's head

to determine the new view-frustum. Thus, in contrast to the direct use of pose

parameters to determine viewpoint disclosed by Kang, Applicants' claim 1 utilizes an

indirect method wherein the view of the scene is defined with reference to a virtual

window. Hence, a movement of a user's head in a lateral direction will have the

perceptual effect of shifting the view of the scene in the opposite direction. Kang does

not disclose a view-frustum defined with reference to a virtual window, nor the

adjustment of such a view-frustum in the manner claimed."

22.   The examiner respectfully disagrees. In Kang's invention, the player is looking at

the virtual reality through an angled view (i.e. the angle about the viewing axis). As the

player's head changes in position, the vertex of said angle will need to move in an

opposite direction in order to move the scene in the same direction that the head is

moving. This is not different from applicants claimed invention.

Response to Arguments

23.   In view of the explanation shown on page 9 of applicant's arguments and

remarks dated 8/4/09, the rejection under second paragraph of 35 U.S.C. 112 is now

withdrawn.

24.   Applicant's arguments filed 8/4/09 have been fully considered but they are not

persuasive.

25.   On pages 10-11, applicant argues, "in regard to "the problem of using [the

tracked movements] to control the viewing of the virtual reality environment" (Col. 8,

lines 26-27), Kang discloses only two methods. The first method taught is "to directly

use the pose parameters to determine the absolute position and orientation of the

viewpoint" (Col. 8, lines 27-29). In other words, a viewpoint set within the virtual reality

environment is moved in the same manner as is detected in the user's face. Thus,

movement of the user's head to the left causes movement of the viewpoint to the left;

rotation of the user' s head in a clockwise direction causes rotation of the viewpoint in a

clockwise direction, etc."

26.   This is not accurate. Kang's discussion on directly using the pose parameters to

determine the absolute position and orientation of the viewpoint is better understood in

view of the camera model that Kang uses. Kang uses a perspective based camera

model (see col 1, 3 and 5). This is contrary to the interpretation the applicant is trying to

impose on Kang's invention. The viewpoint moves according to how the camera would

perceive the scene in the direction of the change in the user's head movement. To

accurately determine the absolute position and orientation of the said perspective of the

viewpoint, the video will move in the opposite direction so that the user sees what the

camera would see if it panned the scene in the direction that the user is turning his/her

head (for example, see Wang US. Patent U.S. 5,742,263 col 1:15-22 which discusses

the perspective change of a viewpoint in view of the movement of a user's head being

tracked by a camera in a virtual reality application).

27.   On page 14, applicant argues, "the Examiner's characterization of various

entities as having particular orientations and therefore certain left and right sides is

arbitrary and subjective. The terms "left" and "right" make sense when used to describe

direction in relation to a user who faces a particular direction (as used above), but are

confusing as applied to other entities, such as the view frustum. Moreover, Applicants'

claimed subject matter is not defined in terms of left and right, but in terms of direction.

Thus, the Examiner is respectfully requested to clarify how the prior art teaches

Applicants' claimed subject matter relating to directionality. IV. Independent claims 14,

46, 59 (new), and the dependent claims are patentable for at least the same reasons as

independent claim 1.

28.   The examiner respectfully disagrees. Since the view frustum has to change in

view of the change in the location of the head, the left and right example makes perfect

sense when applied to entities such as the view frustum. A change in location is broad

enough to also incorporate a change in direction.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to EMMANUEL OMOTOSHO whose telephone number is

(571)272-3106. The examiner can normally be reached on m-f 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EO

/Ronald Laneau/
Primary Examiner, Art Unit 3714
08/28/09